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None

(58) Field of search
A6S

(54) **Toy building brick**

(57) A toy building block has spaced studs (S) of substantially cruciform shaped plan profile projecting externally from its top wall and spaced internal projections (P) of cruciform-shaped plan profile extending internally of the brick from the top wall to the open bottom. Two such bricks are interlockable in three relative positions: (a) with the limb tips of studs (S) engaged between adjacent internal projections (P) or (b) between one or two such projections and a part or parts of the brick side walls, and (c) in which the angles between the limbs of the studs (S) are penetrated by limbs of the cruciform projections (P).
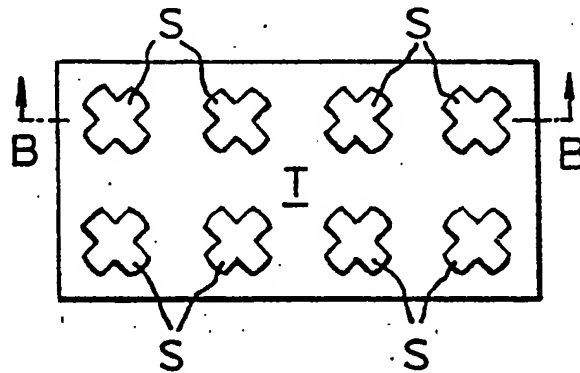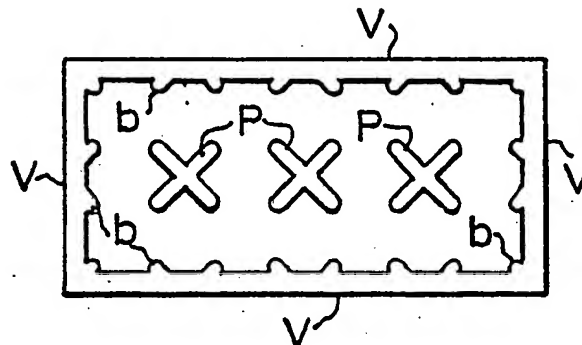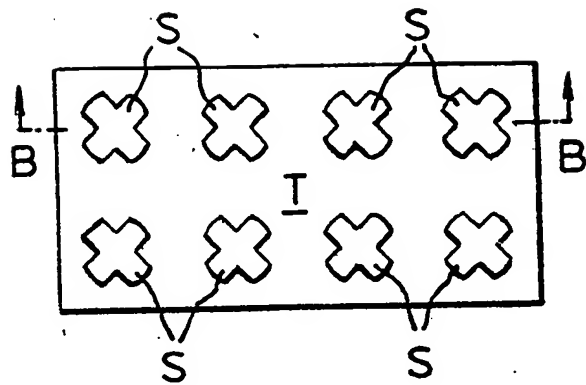

FIG. 1.
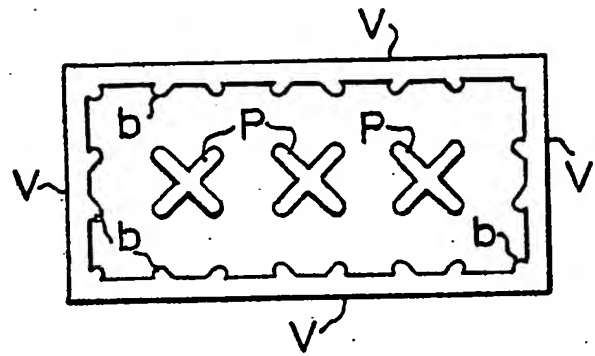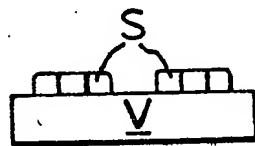

FIG. 2

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FIG.1.

FIG. 2

FIG.3.
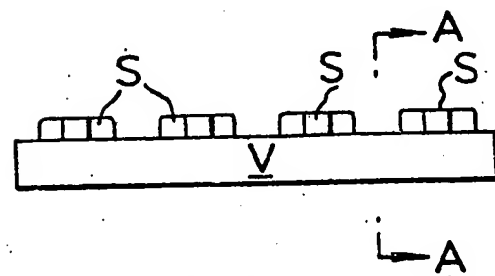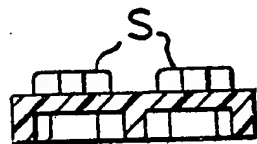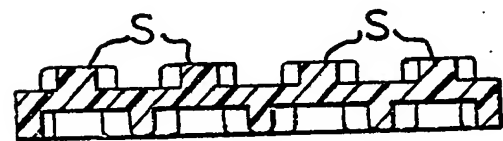
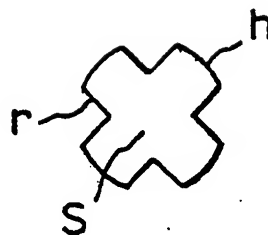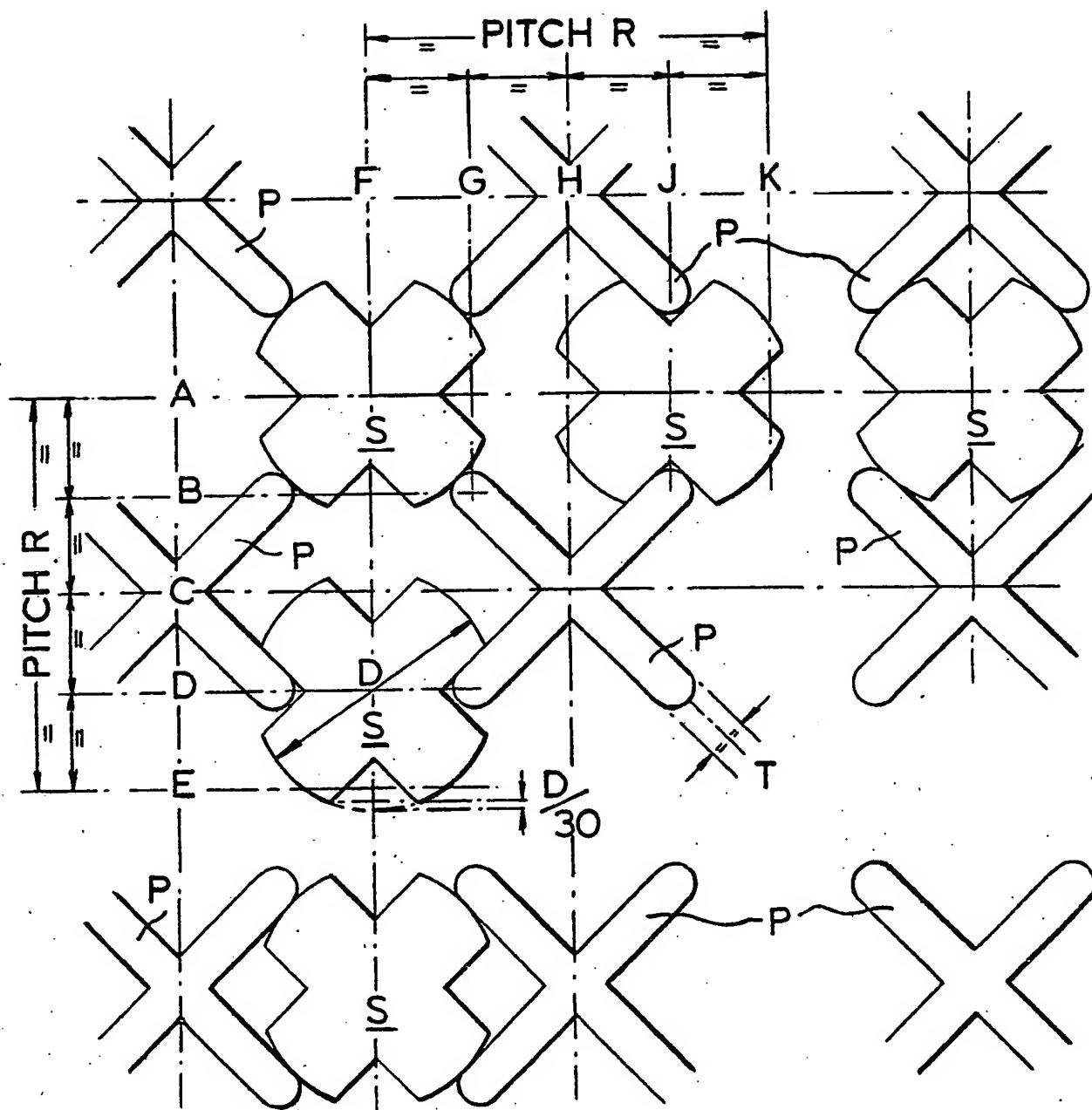FIG.4.

FIG.5.

FIG.6.

FIG.7.

FIG. 8 .

SPECIFICATION

Toy building brick

5 This invention relates to toy building bricks of the kind which are of hollow formation and comprised of a top wall and side walls and whereof the top wall has a plurality of external studs which are spaced apart at a modular distance and a plurality of internal
10 projections located at a modular distance from the side walls such that a pair of such bricks can be interlocked by inserting a stud or studs of one brick into a space or spaces defined between the internal projections and a side wall or side walls of the other
15 brick.

Known toy building bricks of this kind have studs which are circular in plan and have hollow cylindrical internal projections. A typical oblong block has eight such studs in two parallel rows extending longitu-
20 dinally of the block and three such projections.

The present invention has been devised with the general object of a toy building brick which is of distinctive appearance and which is capable of making engagement with a like brick in a relatively
25 large number of alternative positions. A subsidiary object of the invention is to provide a toy building brick of this character which can readily be used in conjunction with currently marketed toy building bricks having the features mentioned in the preced-
30 ing paragraph.

In accordance wit the invention therefore, a toy building brick of the kind referred to, is characterised in that external studs projecting from its top wall are of cruciform shaped plan profile and the internal
35 projections located in spaced relation to one another and to the side walls are also of cruciform shape in plan profile whereby two such bricks are interlock-able with one another in some relative positions with the outside of at least one of the studs engaged
40 between adjacent internal projections, or between one or two such projections and a side wall part or parts of the brick, and other interlocked relative positions in which the angles between limbs of studs are penetrated by limbs of the cruciform projections.
45 A preferred embodiment of the invention is illustrated in the accompanying drawings and is hereinafter described.

In these drawings:-

Figure 1 is a plan view of the toy building brick;
50 Figure 2 is an inverted plan view of the same brick;

Figures 3 and 4 are respectively end and side elevations of the brick;

Figure 5 is a section on line A-A in Figure 4;

Figure 6 is a section on line B-B in Figure 1;
55 Figure 7 is an enlarged plan view of a stud; and

Figure 8 is an enlarged scale diagram to illustrate basic alternative interlocking positions.

Referring now to Figures 1 to 6 there is shown a toy building brick of oblong shape which is normally
60 made of hard slightly resilient synthetic plastics material such as that known as A.B.S. The brick thus has a top wall T, four side walls V and a hollow underside.

The top wall has two parallel straight rows of four

cruciform-shaped plan profile and are equally spaced from one another in directions both longitu-dinally and transversely of the brick. The centre axis of each row is equidistant from the longitudinal
70 centre axis of the brick and from the adjacent longer side wall of the brick and this equidistance is the same as the distance between each end stud in each row and the adjacent shorter side wall of the brick. The four limbs of each stud are radial, separated by
75 90° angles, and inclined at 45° to the four side walls of the brick.

Referring now more particularly to Figures 2, 5 and 6, the underside of the top wall T is formed on its longitudinal centre axis with a row of three equally
80 spaced projections P of cruciform plan profile. The two end projections P have their centres spaced from the adjacent short walls V by the same distance as their centres are spaced from the adjacent long walls V. It should be further noted that opposite the
85 extremity of each arm of the cruciform projections P the inside faces of the walls and the corners therebetween are formed with buttresses b which act to support and locate the sides or recesses of studs S of an identical or similar brick when these
90 studs are inserted between the aforesaid projections P and the walls V.

A typical brick as above described could measure 32mm by 16mm with the studs S at equal centre axis spacings of 8mm.
95 Figure 8 illustrates diagrammatically, but non-exclusively, various alternative positions which a stud of one brick can assume in relation to a cruciform projection of another simialr brick which is interlocked therewith. In Figure 8, lines A B C D and E
100 are lines parallel to one orthogonal axis of the brick and imagined to pass through the centre axis of a stud to indicate the position of the stud in relation to a cruciform projection or projections, five such positions being shown. Thus, in a first plurality of
105 positions A, C and E the outsides ot limb tips of the studs are engaged between parts of the cruciform projections whilst in a second plurality of positions B and D the angle between the limbs of the studs is penetrated by the limbs of the cruciform projections.
110 Also in Figure 8, lines F, G, H, J, K are lines parallel to the other orthogonal axis of the brick and imagined to pass through the centre axis of a stud to indicate the position of the stud in relation to a cruciform projection or projections. Thus in a first
115 plurality of positions F, H and K the outsides of the studs are engaged between parts of the cruciform projections whilst in a second plurality of positions G and J the angle between the limbs of the studs is penetrated by the cruciform projections.
120 It should also be understood that the first plurality of positions also includes those in which the studs engage between one or more of the cruciform projections and the inside face of a wall or adjoining walls, and that the second plurality of positions also
125 includes those in which the studs engage between one or more of the cruciform projections with a wall buttress penetrating the angle between the limbs of a stud to some extent.

Further it should be mentioned that the bricks

tion with currently marketed bricks with cylindrical studs of the same outside diameter and spacings as between the studs themselves and also having equivalent spacings between the projections and the
5   inside wall surfaces. In fact such known bricks can interfit with bricks as above specifically described in positione A, B, AK, EA and EK.

In reference to figure 8 it should be mentioned that where D is the overall stud diameter and assuming
10 D/30 as the criterion for calculating the recess width of the 'S' then the thickness T of the limbs of the cruciform projections should be according to the formula $T = \sqrt{2}(\frac{R}{4} - 0.29D)$ where R is the pitch distance.
15   It is to be understood that although an oblong brick with four studs and three internal projections has been described, the invention is also applicable to rectangular or otherwise shaped blocks of various sizes and with a greater or lesser number of rows of
20 studs and projections and a greater or lesser number of studs and projections in each row subject only to the same inter-relationship between critical dimensions being maintained.

25 CLAIMS

1. A toy building brick of the kind referred to, characterised in that external studs projecting from its top wall are of cruciform shaped plan profile and
30 the internal projections located in spaced relation to one another and to the side walls are also of cruciform shape in plan profile whereby two such bricks are interlockable with one another in some relative positions with the outside of at least one of
35 the studs engaged between adjacent internal projections, or between one or two such projections and a side wall part or parts of the brick, and other interlocked relative positions in which the angle parts of the S-shape of at least one of the studs are
40 penetrated by limbs of the cruciform projections.

2. A toy building brick according to claim 1 in which the limbs of the studs and the cruciform projections are inclined relative to longitudinal and transverse axes of the brick.
45   3. A toy building brick according to claim 1 or 2 wherein the angles between the limbs of the studs are 90°.

4. A toy building brick substantially as hereinbefore described with reference to the accompanying
50 drawings.